

## PLATE XLVII.

- Fig. 1. *Astræa denticulata*, Ellis & Solander,  $\times 1$ ; p. 748.  
 2. " *okeni*, Milne-Edwards & Haime,  $\times 1$ ; p. 749.  
 3. " *rotumana*, n. sp.,  $\times 1$ ; p. 750.  
 4. *Prionastræa abdita*, Ellis & Solander,  $\times 1$ ; p. 758.  
 5. " *fusco-viridis*, Quoy & Gaimard,  $\times 1$ ; p. 759.  
 6. " *echinata*, Dana,  $\times 1$ ; p. 760.

## PLATE XLVIII.

- Fig. 1. *Symphyllia sinuosa*, Quoy & Gaimard,  $\times \frac{2}{3}$ ; p. 738.  
 2. *Hydnophora lobata*, Lamarek,  $\times 1\frac{1}{2}$ ; p. 745.  
 3. " *cvesa*, Pallas,  $\times \frac{2}{3}$ ; p. 745.

## PLATE XLIX.

- Fig. 1. *Cyphastræa savignyi*, Milne-Edwards & Haime,  $\times 1$ ; p. 761.  
 2. *Orbicella wakayana*, n. sp.,  $\times 1\frac{1}{2}$ ; p. 753.  
 3. " *rotumana*, n. sp.,  $\times 1$ ; p. 755.  
 4. " *heliopora*, Lamarek,  $\times 1$ ; p. 756.  
 5. " *funafutensis*, n. sp.,  $\times 1$ ; p. 756.

4. On some Species of Shells of the Genera *Streptaxis* and *Ennea* from India, Ceylon, and Burma. By W. T. BLANFORD, F.R.S., V.P.Z.S.

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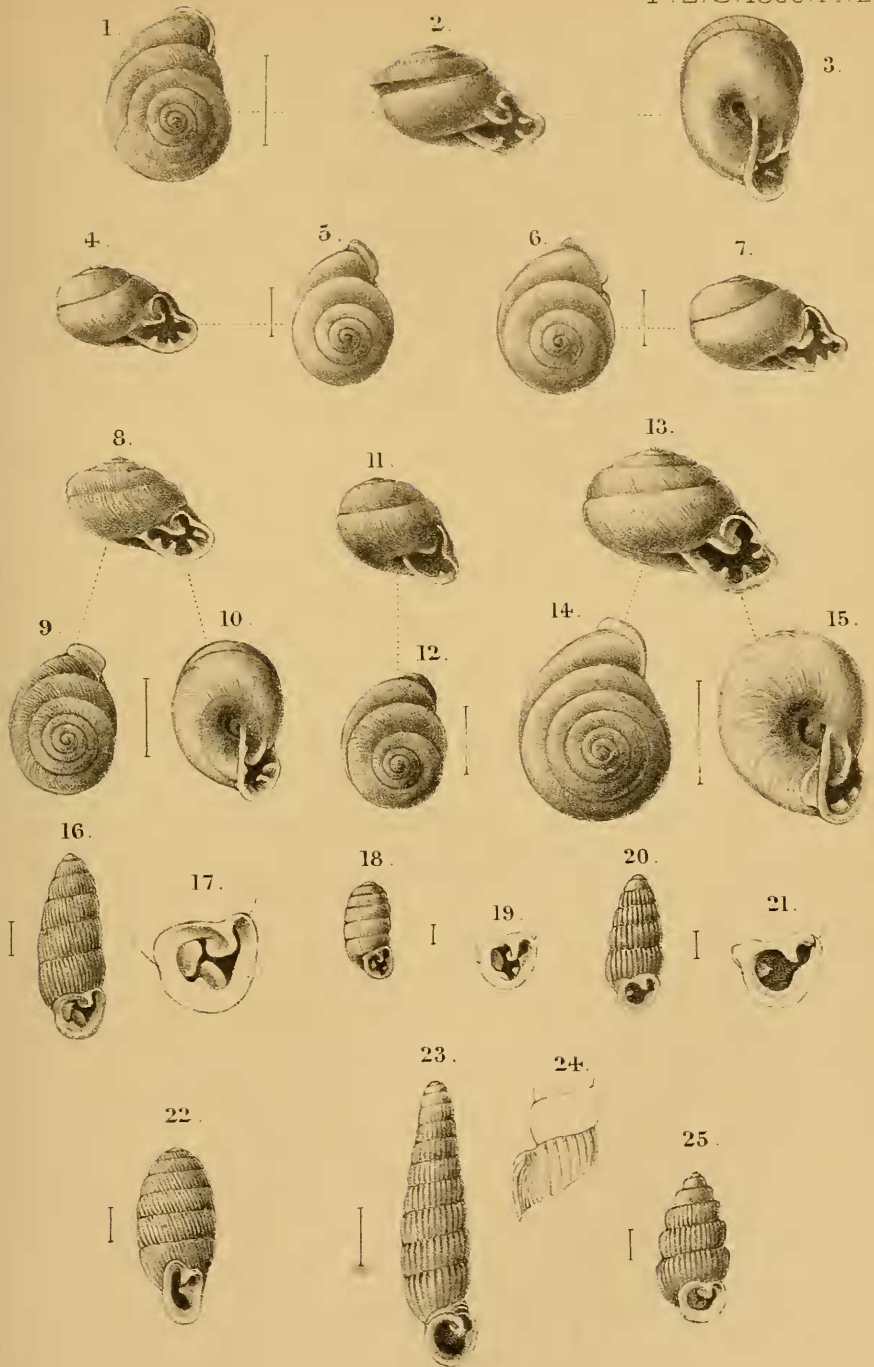
(Plate L.)

In the preparation of a general account of Indian terrestrial Mollusca, I have had occasion to go again over the somewhat numerous forms of *Streptaxis* and *Ennea* found in Southern India by Col. R. H. Beddome, from whose collections I described several species of those genera in 1880<sup>1</sup>. Col. Beddome has very kindly placed in my hands for examination the various additional forms subsequently obtained by him, and although only one more *Ennea* appears to require description, the case is different with *Streptaxis*. This genus abounds on the hills of Southern India, and shows so much variation that it is very difficult to say how many forms present characters sufficiently well marked to justify specific rank. If every variety were described as distinct, a large number of "species" or "subspecies" might be proposed. In the present case only those forms, three in number, which are well marked and easily recognized have received specific names.

A species of *Streptaxis* obtained by Col. Beddome in Burma and another that has long been in my own collection from Ceylon are also described; also an *Ennea* collected in the Nága Hills by Col. Godwin-Austen, and another species from the neighbourhood of Moulmein obtained by Mr. Theobald and now in the British Museum collection at South Kensington. Remarks on some other species are added.

Typical specimens of all the species here described are in the British Museum.

<sup>1</sup> J. A. S. B. xlix. pt. 2, pp. 201-211.





## STREPTAXIS LEVIS, sp. nov. (Plate L. figs. 11, 12.)

*Testa umbilicata, depresso-ovata, levigata, striatula, vitreo-albida; spira depresso-conveva; anfr. 5½, convexiusculi, penultimus ad peripheriam rotundatus, ultra ultimum subtus projectus, ultimus excentricus, subtus convexiusculus, post aperturam haud compressus; apertura diagonalis, fere semiovalis, lamellâ parietali intrante duobusque dentibus minutis, uno basali, alio sinistrâli via columellari, interdum carente, coarctata; peristoma expansum, margine dextro superne ad angulum sinuoso. Diam. maj. 8½, min. 6; alt. 4½ mm.*

*Hab.* Tenasserim (Beddome).

Very near *S. burmanicus* in form, but distinguishable from that and all other known Burmese species by the absence of costulation. Three specimens were collected by Col. Beddome. A near ally is *S. sinuosus* Pfr. from Cochinchina, but that is a much broader shell, with a smaller umbilicus.

## STREPTAXIS BEDDOMII Nevill MS. (Plate L. figs. 4-7.)

*Testa subumbilicata, depresso-ovata, levigata, striatula, nitida, albido-cornea; spira parum exserta, sutura impressa; anfr. 5, convexiusculi, penultimus rotundatus, via ultra ultimum (a basi spectatus) projectus, ultimus excentricus, basi convexus, post aperturam subtus compressus, utrinque juxta peristoma constrictus, in umbilico rugoso-striatus; apertura fere semielliptica, lamellâ unâ parietali, et dentibus 4 parietalibus, duo columellaribus, uno basali, uno dextrali coarctata; peristoma album, expansum, margine dextro ad angulum sinuato, et aliquando in tuberculo parvo parietali desinente. Diam. maj. 6, min. 4½; alt. 3 mm. (Figs. 4, 5.)*

*Hab.* in montibus Animalai dictis Indiæ meridionalis (Beddome).

*Var. major, peristomate quinquedentato, dentibus duobus in margine dextro, uno basali, duobus columellaribus. Diam. maj. 7, min. 5; alt. 3½ mm. (Figs. 6, 7.)*

*Hab.* haud procul a Kuttâlam (Courtallam) in comitatu Tinnevelly, ad alt. 4000 ped. (Beddome).

This species is near *S. watsoni*, W. & H. Blanf., but is distinguished by having only one parietal lamella; the teeth, too, are differently disposed in the mouth, but Southern Indian Streptaxes vary so frequently in their dentition that very little dependence can be placed on it. *S. beddomii* may, however, be recognized by having the proximal tooth on the columellar margin nearly half-way down, and both of the columellar teeth and the basal tooth are simple, equal in size, and nearly equidistant; whilst in *S. watsoni* there is often a small columellar tooth near the body-whorl, and a much larger elongate tooth, which is often more or less bifid, on the distal portion of the columellar margin.

The larger variety of *S. beddomii* from Tinnevelly is chiefly distinguished by having an additional tooth on the right margin above the tooth which is opposite the parietal lamella.

Amongst the specimens sent to me for examination by Col. Beddome is a single shell from the Wynaad which appears to be a still larger form, measuring 8, 6, and 4 mm.

*STREPTAXIS SCALPTUS* sp. nov. (Plate L. figs. 8, 9, 10.)

*Testa rimato-perforata, subumbilicata, depresso-ovata, costulato-striata, subtus levigata, cereo-albida; spira depresso-conoidea, sutura impressa; anfr. 5½-6, convexi, penultimus ad peripheriam rotundatus, paullo ultra ultimum projectus, ultimus excentricus, subtus convexus, versus aperturam circa umbilicum compressus, utrinque fossiculo impresso coarctatus; apertura obliqua, fere semiovalis, lamellis plerumque duobus parietalibus approximatis, sinistrali mediâ longiore intrante, dextrali minore, aliquando carente, dentibusque ad quatuor (interdum 2, 3 vel 5) palatalibus constricta; peristoma album, expansiusculum, juxta angulum mediocriter sinuatum. Diam. max. 10, min. 7; alt. 5½ mm.*

*Hab.* in montibus Kolamalai dictis, haud procul ab urbe Salem Indiae meridionalis (*Beddome*), et in provincia Kadur, regni Indici Mysore (*Daly*).

This, like some other South Indian *Streptaxes*, is a very variable species. Even amongst specimens from the Kolamalais some shells are much more depressed than others, the largest examined measuring  $11\frac{1}{2}$ ,  $8\frac{1}{3}$ , and  $5\frac{1}{2}$  mm. in its three diameters, whilst the smallest measures  $8\frac{2}{3}$ ,  $6\frac{1}{3}$ , and  $4\frac{3}{4}$ . The single specimen from Balur, in the Kadur district of Mysore, measures 10,  $7\frac{1}{2}$ , and  $5\frac{1}{2}$ . Then the palatal teeth vary in almost every individual examined: the normal arrangement appears to be two in the right margin, one of them opposite the end of the median parietal lamella, the other nearer the angle, one basal or distal, and one columellar nearer to the distal extremity of the aperture than to the proximal end. Some specimens (as in fig. 8) have two columellar teeth; in one shell the basal and columellar teeth are wanting, but this is evidently abnormal. Even in the excentricity of the last whorl, shown by the extent to which the penultimate projects when viewed from below, there is some variation.

This species is distinguished from most of the South Indian *Streptaxes* by its subcostulate striation. The species with similar sculpture are *S. pronus*, which is smaller and very differently shaped, and *S. canarius* and *S. subacutus*, with the penultimate whorl keeled.

A single specimen from Torna was obtained some 30 years ago by Col. Evezard and has been in my possession ever since. It was noticed in "Contributions to Indian Malacology, No. xii." (J. A. S. B. xlix. pt. 2, 1880, p. 205), as coming from the most northern locality in Peninsular India from which a *Streptaxis* has been obtained. Torna is a Mahratta hill-fort, near Singharh, south-west of Poona. The Torna shell is large (length  $11\frac{1}{2}$ , breadth  $8\frac{1}{2}$ , height 6 mm.) and somewhat weathered, with the whorls slightly subangulate below the suture and with traces of spiral sculpture on

the last whorl. There are some faint impressed spiral lines on more than one of the Kolamalai specimens. The Torna specimen has only one parietal lamella and five palatal teeth, two being columellar. It should perhaps be classed as distinct.

STREPTAXIS SUBACUTUS, sp. nov. (Plate L. figs. 1, 2, 3.)

*Testa arcuatim rimato-perforata, depresso-ovata, solida, flearose costulato-striata, subtus lævigata; spira depresso-conoidea, apice acutiusculo; anfr. 6½, planulati, penultimus ad peripheriam obtuse carinatus, dimidio latitudinis ultra anfractum ultimum projectus, ultimus valde excentricus, subtus convexiusculus, circa umbilicum versus aperturam angulatus, in umbilico rugoso-striatus, post aperturam fossiculo longitudinali subbasali impressus; apertura subdiagonalis, fere semiovalis, lamellis duobus parietalibus, unâ longiore mediâ, alterâ juxta angulum brevi, tribusque dentibus palatalibus, uno dextrali, secundo basali, tertio columellari, coarctata; peristoma expansum, margine dextrali ad angulum sinuato. Diam. maj. 11½, min. 8; alt. 6 mm.*

*Hab.* South Canara (Beddome).

This is the third and largest species of carinate *Streptaxis* from Southern India, the two others being *S. canarius* and *S. compressus*.

These three species bring up the number of forms described from Southern India to eleven. Owing to the considerable amount of variation, especially in the teeth within the aperture, as already noticed, it is very difficult to make a key to these, but they may generally be identified by the following:—

A. Penultimate whorl rounded at periphery.

- a. Parietal lamellæ 1 or 2, not Y-shaped, nor joined to margin of peristome by raised callus.
  - a. Shell above smooth or slightly striated.
    - a'. Penultimate whorl projecting on lower surface beyond last whorl.
      - a<sup>2</sup>. Two parietal lamellæ (one sometimes in *S. perrotteti*).
        - a<sup>3</sup>. Length 8–10 mm.; usually 3 palatal teeth... *S. perrotteti*.
        - b<sup>3</sup>. Length 6½ mm.; 1 or 2 palatal teeth ..... *S. footei*.
        - e<sup>3</sup>. Length 6 mm.; 3 to 5 palatal teeth ..... *S. watsoni*.
        - b<sup>2</sup>. A single parietal lamella; length 6–7 mm. .... *S. beddomii*.
        - b'. Penultimate concealed by last whorl beneath ..... *S. concinnus*.
      - b. Shell costulately striated above ..... *S. scalptus*.
- b. A single Y-shaped parietal lamella, arising from raised callus that unites margins of peristome.
  - a. Smooth; lower surface of penultimate whorl scarcely projecting ..... *S. personatus*.
  - b. Costulate; half of penultimate whorl projecting ..... *S. pronus*.

B. Penultimate whorl keeled.

- a. Costulate.
  - a. Length about 11½ mm.; 3 palatal teeth ..... *S. subacutus*.
  - b. Length about 7½ mm.; 6 palatal teeth ..... *S. canarius*.
- b. Smooth or striated; 4 or 5 palatal teeth ..... *S. compressus*.

## STREPTAXIS RAVANÆ, sp. nov. (Plate L. figs. 13, 14, 15.)

*Testa rimato-perforata, globoso-ovata, costulato-striata; spira convexa; anfr. 7, planulati, infra suturam subangulati; penultimus ad peripheriam rotundatus, vix ultra ultimum, a basi spectatus, projectus, ultimus subtus convexiusculus, antice circum umbilicum compressus; apertura oblongo-semiovalis, plica intrante parietali et 4-5 dentibus palatalibus (duobus in margine dextro, uno basali, uno vel duobus columellaribus) coarctata; peristoma expansum, ad angulum retro-sinuatum. Diam. maj.  $13\frac{1}{2}$ , min. 10; alt. 7 mm.*

*Hab.* in insula Ceylon.

This is a larger and more globose shell than *S. cingalensis* (which I am inclined to regard as a variety of *S. layardianus*) and with larger and more numerous palatal teeth. It is the largest known *Streptaxis* from the Indian area. I have had a single specimen for many years and am not quite sure from whom I received it, though I have always believed that it came from Major Skinner's collection.

## ENNEA TURRICULA, sp. nov. (Plate L. figs. 16, 17.)

*Testa breviter arcuato-rimata, turrita, subcylindrica, diaphana, nitidula, subdistanter capillaceo-costulata, cereo-albida; spira parum attenuata, apice obtuso, suturâ impressâ; anfr. 6, convexi, duo superiores levigati; apertura verticalis, fere semiovalis, lamellâ unâ tortâ parietali intrante, aliâ columellari obliquâ internâ, tertiâ basali profundâ, et tuberculis duobus, uno basali, alio in margine dextro, ambobus sepe obsoletis, coarctata; peristoma album, callosum, expansum, vix ad angulum sinuatum, marginibus callo lamellifero junctis. Long. 5, diam.  $1\frac{3}{4}$ ; ap. long.  $1\frac{1}{4}$  mm.*

*Hab.* in montibus Animalai dictis, et in provincia Wynaad Indiæ meridionalis (*Beddome*).

The sculpture and dentition can only be distinctly seen in fresh adult specimens, in old shells some of the teeth in the aperture disappear. As in the allied forms *E. pirriei*, *E. macrodon*, &c., the dentition is well developed in half-grown shells.

This species is nearest to the Nilgiri *E. macrodon*, but distinguished by more distant sculpture, by the teeth in the mouth being smaller, and especially by the absence of the great transverse basal lamella of that species.

## ENNEA BREVICOLLIS, sp. nov. (Plate L. figs. 23, 24.)

*Testa turrita, subfusiformis, costulis filiformibus verticalibus ornata; spira sensim attenuata, apice obtuso, sutura impressa; anfr. 11, convexi, primi 3 levigati, ultimus angustior, antice breviter solutus, descendens et creberrime costulatus, utrinque versus basin scrobiculo compressus; apertura rotundo-ovalis, lamina validâ curvatâ intrante parietali, et plicâ palatali oppositâ, coarctata, sinu ad dextrum subrotundo fere separato; peristoma albidum, expansum, reflexum. Long. 8, diam. 2; ap. long.  $1\frac{1}{3}$  mm.*